

Invasive Species: Snails by Jan Meerman

When we think of invasive species, the first thing in everyone's mind is "Tilapia" and maybe "Lionfish". But there are many more invasive species than just these two. If you take a look at the Biodiversity and Environmental Resource Data System for Belize (BERDS:

<http://www.biodiversity.bz/find/species/checklist>) and you check "Alien-Introduced Species" it will take more than a few seconds to download all the alien and/or introduced species for Belize, and this list is surely not complete. Alien species are specifically prevalent amongst the grasses.

About 40 grass species are considered to be of foreign origin. To be an "alien" is not the same as "invasive", scientists disagree about the interpretation of the word "invasive". Usually, invasiveness is associated with an impact on native species and ecosystems. But then, how do you define "impact". In my book there will always be an effect but we call it impact when we can actually see it (or care about it for that matter).

However, you define "invasive", "alien" and or "introduced" we have plenty of them. Most of them are plants but we have alien mammals, reptiles, birds, fishes (no amphibians?) and invertebrates. The latter we know little about, most of us don't really care about these, so we ignore them. But who would have thought there were invasive snails?

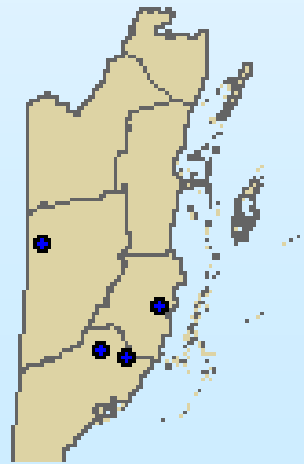
When I received Dan Dourson's delightful little book "A Natural History of the Bladen Nature Reserve and its Gastropods" (2009). I was surprised to learn about two invasive snail species in Belize.

One species is the Florida Slug or Florida Leatherleaf *Veronicella floridana*. This is not really a snail with a shell but a slug. This species is native to the Caribbean and Southern Florida. Recently it has been expanding its range from southern Florida towards the north but apparently also south, but as it turns out, Dan Dourson found it to be very common along the road to Cockscomb. How did it get there? Probably with Citrus or other plant material. Fact is, they seem to be doing OK in Cockscomb.

Negative effects of this slug have not been recorded. In fact, snail eating snakes in the area seem to have developed a liking to this exotic food. But in Cuba it has been shown that this slug can spread diseases amongst chickens. So there is certainly some potential for negative ecological or even economic effects.

Another invasive Gastropod discovered by Dan was the Asian Thorn *Melanoides tuberculata*. This small aquatic snail was identified from the Bladen River.

"Usually, invasiveness is associated with an impact on native species and ecosystems. But the, how do you define "impact"."



^Asian Thorn: current known distribution in Belize



^Asian Thorn: *Melanoides tuberculata*

MSBC and the smile of the month:

What is the definition of a slug?
A snail with a housing problem !



What was the snail doing on the highway?
About one mile a day !

Why is the snail the strongest animal ?
Because he carries a house on his back !

Originally the species hails from South Asia, but is now found in many tropical and subtropical streams around the world. And now then also in Belize. How they managed to spread so widely and so quickly is a bit of a mystery. Fact is that this particular snail has been a favorite in the aquarium trade for decades, and this should be seen as probably the most important factor in its worldwide distribution.

Intrigued by Dan Dourson's finds I went looking for these snails. First in the Bladen River itself, where I quickly sifted a couple out of the river sand (these snails hide in the sand or mud during the day). But other rivers turned out to be "productive as well. And now I have records from all three southern districts of Belize. Where they occur they tend to be very common. Some native fish can be expected to eat these non-native snails. Also Ducks and other waterfowl will probably eat these snails, although data from Belize are lacking so far.

Not all is well though with this species. Research in other countries has shown that this snail can serve as an intermediate host for trematodes (flukes) that can infect wildlife, livestock and even humans. Interestingly, in some countries these invasive snails seem to suppress native populations of snails that are known to transmit chistosomiasis to humans.

While looking for *Melanooides* snails, I stumbled across a very similar but yet clearly distinct species. This species proved to be the Quilted melania *Tarebia granifera*.

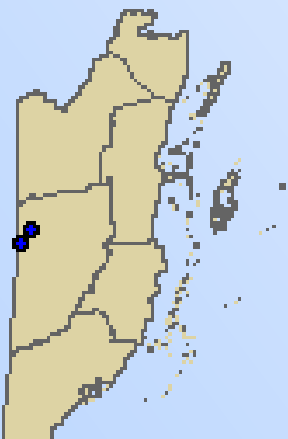
This is another Asian species, which is now on a triumphant tour around the world very similar to that of *Melanooides*. Similar to the previous, *T. granifera* is a detritus feeder. It browses on algae and diatoms and does not feed on vegetation. These snails are adapted to fast-moving water by their streamlined shape and hold their station well during sudden changes in current velocity, which allows them to live in fast flowing streams although they seem to reach their highest density in still waters. Unlike the previous species, this snail does not hide in the substrate during the day.

Similar to *Melanooides*, *Tarebia* has been identified to be an intermediate host to various trematodes. But also they have been used in controlling snails that are known to transmit chistosomiasis to humans. They appear to be simply out-competing the native snails that house these parasites. This in itself is a bit of a warning, as this proves that they can suppress and even replace native aquatic snail species. I placed some *Melanooides* snail in an aquarium that already contained a healthy population of native *Mexinauta princeps* snails, and within a few weeks all the *Mexinauta* snails had died. This doesn't prove anything, but there are similar cases reported in the literature.

What makes these slugs and snails such successful invaders? Much is still unknown, but an interesting fact is that all these species are parthenogenetic meaning that all individuals are females that can reproduce without the need of males. With this in mind, it takes only one individual to start a colony. But apart from that characteristic, they all have no doubt been moved around by people, inadvertently with plant material or deliberately as aquarium pets or even pest control.

Fact is there is a lot going on right under our noses, but very few pay attention. For some student readers there are some interesting research topics. How do these snails displace/kill native species for example? All you need is an aquarium with some snails, a notebook and a couple of weeks of your time....

"What makes these slugs and snails such as successful invaders? ...an interesting fact is that all these species are parthenogenetic..."



Known Quilted Melania distribution in Belize



Quilted melania *Tarebia granifera*

Quilted melania *Tarebia granifera*

MSBC NEWS

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The MSBC in full support of the UB-EC!



The UB En-
vironmental Club
promoting
Riparian
Forest Pro-
tection.

(left)

The club also
cheered as the
fun time
dragged us
into the clean-
ing of the river
banks.



Clean-up Campaign: 130 gar-
bage bags collected during La
Ruta Maya Race.



The river challenge brought out the team spirit in helping us to increase environmental awareness. Andrew Link (right), student MSBC member substituted Eduardo Barrientos (top left) for the race.



MSBC
monetary
contribution
assisted in
acquiring a
racing cano-
e for the
club. above